

SIX NEW SPECIES OF *VERNONIA* FROM SOUTH AMERICA.

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Continuing work in South American Asteraceae was resulted in the recognition of the following one new variety and six new species.

VERNONIA CANESCENS H.B.K. var. *OPPOSITA* H. Robinson, var. nov.

Folia opposita; inflorescentiae densae; bracteae involucri acutae non pungentiter acuminate.

TYPE: COLOMBIA: Magdalena: Santa Marta, Cerro Quemado. 17 Dec. 1922. *H.L.Viereck* 6 (Holotype, US). PARATYPES: COLOMBIA: Magdalena: Santa Marta. 1898-1901. *H.H.Smith* 1981 (US); Summit of Cerro San Lorenzo, 3000 m. Shrub. 1941. *Bro. Apolinario A. 607* (US); Mount San Lorenzo, near Santa Marta, 1900-2400 m. July 1932. *W.Seifriz* 121 (US).

The opposite-leaved plants from the Santa Marta region of Colombia seem to form a distinct population, but the phyllotaxy, denser inflorescence, and less pointed involucral bracts seem to represent only a varietal level of distinction. Nevertheless, opposite leaves would appear to be very unusual in the *Lepidoploa* element of *Vernonia*. The present variety has no close relation to other opposite-leaved Vernonieae known from the northern Andes (Cuatrecasas, 1956; Robinson, 1980).

VERNONIA BISHOPII H. Robinson, sp. nov.

Plantae suffrutescentes vel frutescentes 1 m altae. Caules lati subteretes vel subtiliter 5-angulati dense sordido-velutini. Folia alterna, petiolis plerumque 0.5-1.5 cm longis; laminae oblongae plerumque 4-11 cm longae et 3.0-5.5 cm latae base late obtusae margine multo subdenticulatae apice breviter obtusae supra dense praeter in nervis primariis evanescitae sub-tomentoso-puberulae, pilis T-formibus sessilibus, in nervulis leniter prominulae subtus dense sordide tomentosae, nervis secundariis utrinque ca. 7-11 late divaricatae distincae arcuatae. Inflorescentiae in seriebus cymosae, bracteis foliiformibus plerumque 2.5-3.5 cm longis et 2-3 cm latis. Capitula sessilia 2.0-2.5 cm alta et 1.7-2.0 cm lata; squamae involucri ca. 90 appressae oblongo-lanceolatae 5-10 mm longae et 1.5-3.0 mm latae apice breviter acutae vel obtusae minute apiculatae ca. 50 exteriores extus subapicaliter dense aureo-tomentellae interiores superne purpurascentes. Flores ca. 75 in capitulo; corollae albae ca. 10 mm longae extus glabrae, tubis ca. 4.5 mm longis infundibularibus, faucibus ca. 2 mm longis, lobis lanceolatis ca. 4 mm longis et inferne 0.7 mm latis apice extus vix spiculiferis;

Thecae antherarum ca. 4 mm longae; appendices antherarum ca. 1 mm longae et 0.23 mm latae glabrae; basi stylorum non noduliferi, scapi stylorum in partibus superioribus hispidulis ca. 1 mm longi; rami stylorum ca. 4.5 mm longi non glanduliferi. Achaenia ca. 3 mm longa dense lanata non glandulifera; carpopodia cylindrico-obturaculiformia 0.25 mm longae et ca. 0.5 mm latae; setae pappi albae ca. 55 plerumque ca. 8 mm longae superne sensim distincte latiores margine scabridulae extus laeves; squamae exteriorees anguste lanceolatae ca. 2 mm longae margine scabridulae extus laeves. Grana pollinis oblata ca. 50 μ alta et 60 μ lata valde lophorata, cristis altis minute multo spinuliferis, spinis majoribus nullis (reticulation *V. argyrophylla*-type).

TYPE: BRASIL: Goiás: Serra dos Pirineus, ca. 15 km (straight line) N of Corumbá de Goiás; elev. ca. 1300 m; rocky hillside with blocky outcrops of metamorphic rock. Shrub 1 m tall; flowers white. 14 May 1973. W.R. Anderson 10287 (Holotype, UB; isotype, US). PARATYPE: BRASIL: Goias: 5-12 km S of Alto Paraiso de Goias, mostly E of road to São João da Aliança, elev. 3300-3800 ft. Subligneous herb branched from base, 1 meter tall, flowers all past anthesis. Feb. 8, 1981. R.M. King & L.E. Bishop 8899 (UB, US).

The type specimen of the new species was distributed under the name *Vernonia flavescens* Glaziou, and the material appears to match a photograph of a supposed type of that species. Unfortunate, the Glaziou species was never validly described, and the name is a latter homonym of *V. flavescens* Less. The species is one of those with thick tomentum and large haeds. Yellow tomentum extends onto the basal half of the involucre, leaving the purplish tips exposed.

VERNONIA CARDENASII H. Robinson, sp. nov.

Plantae suffrutescentes vel infirme frutescentes 2-3 m altae paucæ ramosæ. Caules teretes leniter striati dense puberuli, pilis T-formibus breviter vel non stipitatis, pilis paucis erectis multiseptatis uniseriatis. Folia alterna, petiolis 2-3 cm longis; laminae herbaceæ late ellipticae 4-11 cm longae 1.5-6.0 cm latae base obtusæ vel late acutæ margine integrae vel subintegrae apice obtusæ et breviter apiculatae supra dense puberuli subtus in nervis dense pilosulae aliter dense minute glandulo-punctatae et sparse pilosæ, pilis T-formibus longe stipitatis, nervis secundariis utrinque 5-6 late divaricatis. Inflorescentiae thyrsoidæ in ramis corymboso-cymosæ, pedunculis 1-3 cm longis dense puberulis vel subtomentosis; bracteis inflorescentiis minutis. Capitula late campanulata ca. 2 cm alta et 1.0-1.5 cm latae; squamae involucri ca. 60-70 ca. 6-seriatae in apicibus plerumque reflexæ vel extrorse circinatae anguste oblongæ vel lineares 3-15 mm longæ et 1.5-2.0 mm latae apice plerumque anguste obtusæ extus rufo-tomentosæ. Flores 30-35 in capitulo; corollæ purpureæ ca. 19 mm longæ in tubis et faucibus glabrae, tubis 10-11 mm longis inferne perangustis, faucibus ca. 2 mm

longis, lobis linearibus ca. 7 mm longis et 0.7 mm latis extus plerumque glabris apice spiculiferae et perpaucе glandulo-punctatae; thecae antherarum ca. 3.5 mm longae; appendices antherarum anguste oblongo-ovatae ca. 1 mm longae et 0.3 mm latae; basi stylorum in nodis disciformes; scapi stylorum in partibus superioribus hispidulis ca. 0.6 mm longi; rami stylorum ca. 4 mm longi non glanduliferi. Achaenia submatura ca. 2.8 mm longa base dense glandulo-punctata aliter non glandulifera dense longe setifera; carpopodia obturaculiformia ca. 0.25 mm longa et 0.5 mm lata; setae pappi albidae persistentes interiores ca. 50 plerumque 11-12 mm longae apice non latiores margin dense errecte scabridulae; squamae exteriores anguste lanceolatae ca. 1.5 mm longae margine et extus scabridulae. Grana pollinis in diametro ca. 55 um subregulariter areolata et spinulosa (*Lychnophora*-type).

TYPE: BOLIVIA: Cochabamba: Cordillera of Chimore, 2700 m. Shrub, slender 2-3 m high. At forest edge. Nov. 1, 1937.

M. Cardenas 2079 (Holotype, US).

The new species keys to *Vernonia fulta* Griseb. in Gleason (1923), and has the broadly oblong or elliptical petiolate leaves and large heads in subcorymbose cymes similar to the latter species. Still, *V. fulta* differs by having heads only half to two-thirds as high with the bracts erect and sparsely puberulous.

VERNONIA COULONIOIDES H. Robinson, sp. nov.

Plantae suffrutescentes ca. 0.8 m altae superne paucе ramosae. Caules brunnescentes teretes striati evanescentiter puberuli. Folia alterna subsessilia, petiolis ca. 1 mm longis; laminae oblongae plerumque 2-4 cm longae et 0.5-1.5 cm latae base anguste rotundatae margine intergrae anguste revolutae apice pungentiter acutae utrinque lucido-virides supra sparse appresse pilosulae subtus sparse puberulae et dense glandulo-punctatae, nervis secundariis utrinque ca. 3-5 ca. 45° ascendentibus vix arcuatis. Inflorescentiae dense serialiter cymosae, bracteis minutis. Capitula seesilia ca. 7 mm alta et 5-6 mm lata; squamae involucri ca. 50 ca. 5-seriatae ca. 40 exteriores in apicibus leniter recurvae anguste ovatae vel lanceolatae 1.5-4.0 longae et 0.8-1.0 mm latae pungentes ad medio leniter costatae interiores anguste oblongae ad 5 mm longae et 1.2 mm latae apice obtusae vel breviter obtusae minute apiculatae interdum purpureo-tinctae, squamae omnino extus minute puberulae et sparse glandulo-punctatae. Flores ca. 22-25 in capitulo; corollae albidae vel superne lavandulo-tinctae 5-7 mm longae in tubis superioribus faucibus et apices lobarum dense glandulo-punctatae, tubus 2-4 mm longis inferne perangustis superne infundibularibus, faucibus ca. 0.5 longis, lobis linearibus ca. 2.5 mm longis et 0.4 mm latis sub-apice perminute paucе spiculiferis; thecae antherarum ca. 1.8 mm longae; appendices antherarum ca. 0.4 mm longae et 0.2 mm latae extus dense glanduliferae; basi stylorum in nodis minute disciformes; scapi stylorum in partibus superioribus hispidulis ca. 0.4 mm longi; rami stylorum ca. 1.5 mm longi abaxialiter gland-

uliferi. *Achaenia* ca. 1 mm longa late obpyramidalia breviter setifera glandulifera et multo prominentiter punctata, punctis superficialibus 1-3-cellulatis subglanduliformibus; setae pappi albidae interiores subpersistentes ca. 40 plerumque ca. 4 mm longae superne vix vel non latiores margine et extus scabridulae; squamae exteriores lineares ca. 0.5 mm longae extus perminute scabridulae sublaeves. Grana pollinis oblata ca. 37 μm alta et 45 μm lata valde lophorata, cristis altis minute multo spinuliferis, spinis majoribus nullis (reticulation *V. geminata*-type).

TYPE: BRASIL: Rio de Janeiro: Mun. Cabo Frio, Praia do Pontal, Cabo Frio $22^{\circ}56'48''$ S., $42^{\circ}01'54''$ W., near sea level. April 17, 1952. L.B. Smith with A. Magnanini, S.L. Oliviera e Silva, L. Dau, W.T. Ormond & Z. Lopes da Silva 6587 (Holotype, UB; isotype, US). PARATYPE: BRASIL: Rio de Janeiro: Cabo Frio, Arraial do Cabo, Praia do Pontal. Restinga. I-214?-1953. F. Segadas-Vianna, L. Dau, W.T. Ormond, G.C. Machline & J. Lorêdo Jr. Museo Nacional Cat. no. 117984 (R, US).

The new species is another of the numerous members of the *Vernonia geminata* group, in the subgroup having minute bracts in the inflorescence. Of the related species, *V. geminata* Less. differs by the longer and denser hairiness of the leaves, the more strongly ascending secondary veins, and the reflexed outer involucular bracts. The new species has greater similarity to *V. coulonii*, but differs by the narrower more shiny leaves with dense glandular-punctuation and short hairs on the under surface. The leaves of *V. coulonii* Sch.Bip. ex Baker have long rather sericeous pubescence on the under surface, and the floral parts seem to be generally larger. Corollas seen in two specimens of the latter species seem to lack the dense glandular pubescence on the throat and distal part of the tube.

VERNONIA LIESNERI H. Robinson, sp. nov.

Plantae frutescentes ca. 1.5 m alta mediocriter ramosae. Caules teretes vix striati dense minute appresse puberuli, pilis uniseriatis base dense 1-5-septatis in cellulis apicalibus elongatis. Folia alterne, petiolis 2-5 mm longis; laminae anguste ellipticae plerumque 4-6 cm longae et 1.0-1.5 cm latae base et apice acutae margine subintegrae vel remote subserrulatae supra et subtus immerse glandulo-punctatae et minute appresse puberulae, nervis secundariis obscuris utrinque ca. 4-6 ca. 45° ascendentibus vix arcuatis. Inflorescentiae serialiter cymosae, bracteis foliiformibus 2-4 cm longis et 0.5-1.0 cm latis. Capitula sessilia vel subsessilia 9-10 mm alta et ca. 4-5 mm lata; squamae involucri ca. 35-40 ca. 5-seriatae erectae appressae 1.0-6.5 mm longae et 0.8-1.5 mm latae plerumque lanceolatae et acutae interiores oblongae et apice breviter obtusae apiculatae omnino extus tenuiter appresse puberulae superne sordido-vittatae minute immerse glandulo-punctatae. Flores ca. 8-9 in capitulo; corollae lavandulae ca. 7 mm longae extus in tubis et faucibus sparse pilosulae base densiores in lobis subapice dense pilosulae et

glandulo-punctatae, tubis late leniter infundibulares ca. 3 mm longis; faucibus ca. 1 mm longis; lobis linearibus 2.7-3.0 mm longis inferne ca. 0.6 mm latis; thecae antherarum ca. 2 mm longae; appendices antherarum anguste ovatae ca. 0.6 mm longae et 0.25 mm latae glabrae; nodi stylorum breviter obturaculiformes; scapi stylorum in partibus superioribus hispidulis ca. 0.5 mm longi; rami stylorum ca. 2.5 mm longi. Achaenia submatura 1.8 mm longa dense setifera et inter costas glandulifera; carpopodia anguste turbinata ca. 0.2 mm longa et 0.27 mm lata; setae pappi albidae ca. 40 plerumque 4.5-5.5 mm longae superne vix latiores margine et extus scabridae; squamae exteriores lineares ca. 1 mm longae extus sparse scabridae. Grana pollinis oblata ca. 45 um alta et 55 um lata valde lophorata, cristis altis minute multo spinuliferis, spinis majoribus nullis (reticulation *V. cognata*-type).

TYPE: VENEZUELA: Tachira: Vicinity of Las Minas, north of La Laguna, 16 km SE of Santa Ana, Lat. $7^{\circ}36'N$, Long. $72^{\circ}13'W$. Primary wet forest. Alt. 1150-1250 m. 28 July 1979. J.A.

Steyermark & R. Liesner 118879 (Holotype, US; isotype, MO). PARATYPE: VENEZUELA: Tachira: Cerro Las Minas, bordering Quebrada Las Minas, 18-20 km SE of Santa Ana, Lat. $7^{\circ}36'N$, Long. $72^{\circ}13'W$. Alt. 1150-1250 m. Primary forest over sandstone substrate. Open sandstone slopes bordering virgin forest in zone of more dwarfed trees. Flowers lavender; stem 1.5 m tall. 29 July 1979.

J.A. Steyermark & R. Liesner 119046 (MO).

The new species differs from related species by the fewer flowers in the head and by the glandular-punctate leaves with obscure secondary veins.

VERNONIA MEXIAE H. Robinson, sp. nov.

Plantae subscandentes vel scandentes ad 9-10 m mediocriter ramosae. Caules brunnescentes striati vel costati puberuli inferne glabrescentes. Folia alterna, petiolis ca. 1 cm longis; laminae subcordiaceae oblongo-ovatae vel oblongae base rotundatae vel obtusae margine integrae apice acuminatae supra glabrae subtus appresse puberulae, pilis brevibus. Inflorescentiae late pyramidaliter thyrsideo-paniculatae in ramis subracemosae. Capitula solitaria vel in glomerulis pauci-capitatis pedicellata; bracteis inflorescentiis minutis; involucra late campanulata 4-5 mm alta et 3-4 mm lata; squamae involucri ca. 25 erecto-appressae oblongae vel suborbicularis 1-4 mm longae et 0.7-1.0 mm latae apice rotundatae vel apiculatae extus glabrae superne purpurascenes. Flores 8-10 in capitulo; corollae purpureo-roseae ca. 5 mm longae anguste infundibulares ca. 5 mm longae extus praeter apicem loborum glabrae; tubis ca. 2 mm longis, faucibus ca. 1.8 mm longis, lobis lanceolatis ca. 1.3-1.5 mm longis et base ca. 0.4 mm latis fere ad apicem paucis glandulo-punctatis; thecae antherarum ca. 1.5 mm longae; appendices antherarum lanceolatae ca. 0.6 mm longae et 0.17 mm latae glabrae; base stylorum annuliformes; scapi stylorum in partibus superioribus hispidulis ca.

0.8 mm longi; rami stylorum ca. 2 mm longi non glanduliferi. Achaenia ad 2 mm longa breviter setulifera; carpopodia leniter turbinata ca. 0.15 mm longa et 0.3 mm lata; setae pappi albidae vel flavescentes subpersistentes ca. 35 plerumque 3.5-4.0 mm longae apice vix vel non latiores margine et extus dense scabridulae; squamae exteriores anguste oblongae 0.5-0.7 mm longae extus scabridulae. Grana pollinis in diametro ca. 35 μ m subregulariter areolata et spinulosa (*Lychnophora*-type).

TYPE: PERU: Distrito Churubamba, Hacienda Mercedes, La Purisima; within border of forest. Alt. 1750 m. Suffrutescent; long, scandent branches, brownish flower. Common locally. Sept. 24, 1936. Y. Mexia 8229 (Holotype, US). PARATYPE: PERU: San Martin: Prov. Mariscal Caceres - Tocache Nuevo. Quebrada de Pólvora, 10 km abajo de Puerto Pizana (Márgen derecha del río Huallaga). A orilla del río en bosque alto terreno rocoso. Trepadora de 9-10 metros. Flores purpura rojizo fuerte, 2.5RP5/10, brácteas pardas. Las láminas de las hojas son onduladas brillosas de color verde oscuro. Jun. 10, 1971. J. Schunke V. 4974 (US).

The pyramidal form of the inflorescence is reminiscent of the genus *Critoniopsis* of the subtribe Piptocarphinae (Robinson, 1980), but the new species lacks the glabrous achenes and blunt hairs on the style branches of that group. The subracemose branches of the inflorescence are rather unusual in the tribe.

VERNONIA RIMACHII H. Robinson, sp. nov.

Plantae suffrutescentes erectae ad 7.5 dm altae mediocriter ramosae. Caules sericeo-pilosi. Folia alterna, petiolis 3-5 mm longis; laminae oblongo-ellipticae 4-7 cm longae et plerumque 1.5-2.0 cm latae base anguste rotundatae margine anguste reflexae superne paucе subserrulatae apice acutae vel subacuminatae supra sericeo-pilosae subtus glandulo-punctatae et plerumque in nervis et nervulis sericeo-pilosae. Inflorescentiae paucе ramosae, ramis serialiter cymosis in nodis vix vel non deflectis dense sericeis, bracteis foliiformibus 2-4 cm longis et 0.5-1.5 cm latis. Capitula in seriebus solitaria vel raro geminata sessilia axillaria; involucra brunnescentes campanulata 6-7 mm alta et lata; squamae involucri exteriores ca. 35 anguste lanceolatae subappressae vel laxe patentes 3-5 mm longae et base ca. 0.5 mm latae apice perangustae subaristatae extus sparse sericeae, squamae interiores ca. 12 erectae oblongo-lanceolatae ca. 6 mm longae et 1 mm latae apice argute acutae extus superne sparse puberulae. Flores ca. 25 in capitulo; corollae azureae? ca. 6 mm longae, tubis ca. 3 mm longis infundibularibus inferne perangustis glabris, faucibus ca. 0.8 mm longis glabris, lobis oblongo-lanceolatis ca. 1.5 mm longis et 0.4 mm latis extus plerumque glabris in apicibus multo glandulo-punctatis; thecae antherarum ca. 1.2 mm longae; appendices antherarum ovatae ca. 0.25 mm longae et 0.2 mm latae apice obtusae extus glanduliferae; basi stylorum annuliformes; scapi stylorum in partibus superior-

ibus hispidulis ca. 0.5 mm longi; rami stylorum ca. 1 mm longi extus glanduliferi. Achaenia submatura ca. 1.2 mm longa glandulifera non setulifera; carpopodia turbinata ca. 0.35 mm longa et lata; setae pappi subpersistentes ca. 30-35 ca. 4 mm longae apice latiores margine et extus dense scabridulæ; squamæ exteriores oblongo-ellipticæ ca. 1 mm longæ extus sublaeves. Grana pollinis in diametro ca. 50 um valde lophorata, cristis altis minute multo spinuliferis, spinis majoribus nullis (reticulation *V. geminata*-type).

TYPE: PERU: San Martin: Dpt. Tarapoto. Carretera de Tarapoto-Yurimaguas, km 12 to 16, elev. ca. 2250 ft., wet montane forest, sandy rocky soil, herb, corolla blue. Aug. 23, 1978. *M.Rimachi* Y 3856 (Holotype, US).

The only *Vernonia* with glands on the achenes included in the treatment of peruvian Vernonieae by Jones (1980) is *V. yurimaguasensis* Hieron., a very different species more like *V. patens* H.B.K. in aspect. The new species is a member of the *Vernonia geminata* group, but it differs from most of the brasiliian members by the large folliform bracts of the inflorescence. The closest relative might be *V. retrosetosa* H.Robins. of Peru, but the new species lacks the distinctive pubescence of the stems, the marked serration of the leaves, and the setiferous achenes of that species.

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Vermonia bishopii H. Robinson, Isotype, United States National Herbarium. Photos by Victor E. Krantz, Staff Photographer, National Museum of Natural History.



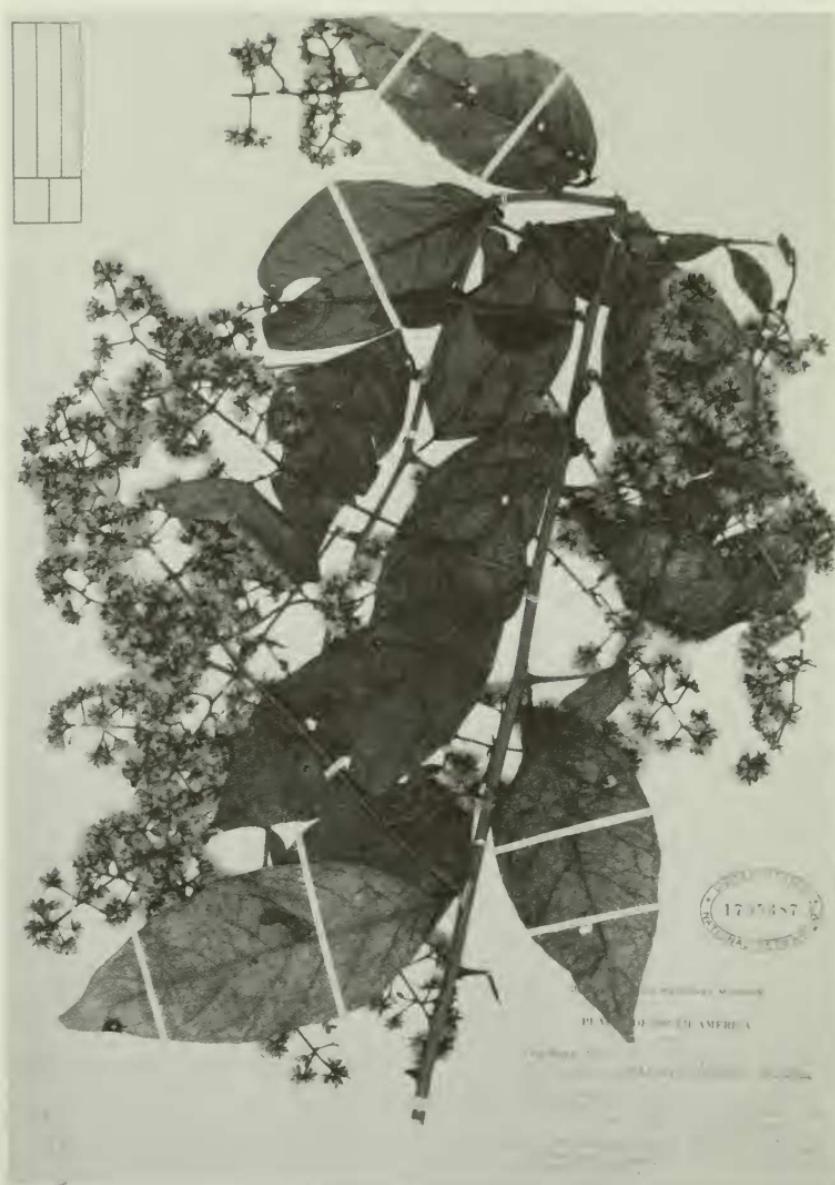
Vernonia cardenasi H. Robinson, Holotype, United States National Herbarium.



Vernonia coulonioides H. Robinson, Holotype, Herbário
Universidade de Brasília.



Vernonia liesneri H. Robinson, Holotype. United States
National Herbarium



Vernonia mexiae H. Robinson, Holotype, United States
National Herbarium.



Vernonia rimachii H. Robinson, Holotype, United States National Herbarium.



Enlargements of heads of *Vernonia*. Top. *V. bishopii*,
V. cardenasiae. Middle, *V. coulomoides*, *V. liesneri*. Bottom.
V. mexiae, *V. rimachii*.